

QUALITY OF LIFE IN THE ELDERLY POPULATION LIVING IN BUNGSAN AND ONGKARAK SUB-DISTRICT, NAKHON NAYOK PROVINCE, THAILAND

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ABSTRACT:

Background: Ageing is a phenomenon of both developed and low and middle income countries throughout the globe. Therefore, measurement of quality of the life in ageing populations stands as an important indicator in order to devise proper health care planning in future.

Methods: The objective of the study was to measure health-related quality of life (HRQOL) among elderly populations residing in Bungsan and Ongkarak sub-district of Nakhon Nayok Province, Thailand. Further, it examined the factor affecting quality of life of aged people living in Bungsan and Ongkarak. This was a community based study where multi-stage sampling technique was used to select 471 subjects over 60 years of old. Data were collected using structured SF-36 questionnaires, version 2.0 by trained interviewers. The outcome variable HRQOL was measured using two sub-components – Physical Component Summary (PCS) and Mental Component Summary (MCS). The researchers assessed overall HRQOL among gender and age groups (60-75 years vs. >75 years) of elderly people.

Results: Among all participants, 197 (41.8%) were men, 274 (58.2%) were women, 375 (79.6%) aged 60-75 years; 96 (20.4%) aged over 75 years. Multiple logistic regression indicated that older individuals (> 75 years) possess a higher risk of having low quality of life in both PCS and MCS characteristics of health [OR: 1.20, 95% CI: 1.11 to 3.35 and OR: 2.69, 95% CI: 1.38 to 5.26 respectively] than those aged 60-75 years. In addition, those who suffer from a chronic disease were more likely to have a higher risk of lower score mainly in PCS of HRQOL [OR: 1.15, 95% CI 1.12 to 2.93]. Furthermore, the literate had a lower risk of having low mental scores of HRQOL than those of illiterates [OR: 0.38, 95% CI 0.19 to 0.77] whereas those respondents living alone, had a higher risk of having decreased mental scores of HRQOL, than those of living together with their family [OR: 4.50, 95% CI 1.75 to 11.58].

Conclusion: Therefore, the Thai health system should be responsive towards the needs of elderly population and specific prevention strategies must be tailor-made to improve their overall well-being and quality of life.

Keywords: Elderly health, Quality of life, SF-36, Thailand

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INTRODUCTION

The number of older population across the world is increasing day by day [1]. It is estimated that the global population with age 60 years and above is going to be twofold (from 542 million to nearly 1.2 billion) by the year 2025 [1]. The older people living in low and middle income countries will also be very high and will reach 850 million by the year 2025 [1]. By September 2010, the

population of Thailand was 65.98 million from whom 8.5 million people (12.9%) were 60 years and above [2]. Further, the Ministry of Public Health, Thailand has estimated an increase in elderly population to nearly 20 percent by 2025 and 25 percent by 2030. The Ministry has also estimated that approximately 150,000 elderly people are dependents, and this number will reach 240,000 by 2019. In addition, more than 70% of current dependent elderly do not receive adequate support from their peers and families [3]. Also, the Thai Ministry of Social Development and Human

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Security (2009) estimated that about 43 percent of old people were in good health. The people aged over 80 years had more chronic health problems than other age groups and only 7.7 percent lived by themselves in 2007 [4].

With increase in the life expectancy, it is believed that elderly people are more prone to chronic diseases such as cancer, hypertension, diabetes, cardio vascular disease, coronary heart diseases and osteoporosis. As these diseases are more common among older people and cause socio-pathological problem, these could limit their activities and may result in a decrease in health-related quality of life (HRQOL) [5]. Therefore, more attention should be paid to this important problems of HRQOL among aged populations [6]. There are different dimensions of HRQOL such as social, physical and mental functions [7] that could explain the overall state of health of an individual. Past studies also showed that the low HRQOL is related to higher rates of morbidity and mortality and needed greater efforts to use of proper health care planning and utilization [5, 7, 8]. Therefore, the measurement of HRQOL stands as a crucial indicator for old people that could help in proper health planning in future [8].

Bungsan and Ongkarak are one of the central sub-districts of Thailand which is situated in Nakhon Nayok province. The statistics we obtained from Ongkarak sub-district Administrative Organisation and Bungsan sub-district Administrative organisation, it found that Bungsan had a total population of about 4896 and Ongkarak had about 3486 in September 2010. There were also 655 elderly people in Bungsan and 481 elderly people in Ongkarak residing in the same period [9, 10]. This two sub-districts were chosen considering higher number of elderly population in these two sub-districts. It was seen that the proportion of older people reside in these sub-districts are about 14% from the total population [9, 10] which is higher than the national average of 12.9% of older population [2]. Further, to our knowledge, no studies have been carried out to measure HRQOL among old persons in Bungsan and Ongkarak sub-district. Therefore, this study makes a unique contribution and aimed to measure HRQOL among elderly population. The paper also examines the factor affecting quality of life of aged people living in Bungsan and Ongkarak, Thailand. The findings could be useful for health program planners to formulate specific preventive and rehabilitative measures to maintain good health status and quality of life among elderly people.

MATERIALS AND METHODS

This was a population based cross-sectional quantitative study which was conducted between September-November 2014 to examine the HRQOL among older population of 60 years and above living in Bungsan and Ongkarak sub-district of Nakhon Nayak province. The sub-districts has around 1136 populations who are 60 years of age and above [9, 10]. We considered approximately 33.3% (one-third) of this population as a sample size in this study which was yielding about 379 inhabitants. Further, to increase the power of the study, we increase the sample size up to 500 individuals. Using a multi-stage sampling method, a total of 500 individuals from both sub-districts – aged above 60 years were considered for interview. Firstly, a cluster sampling method was used to divide the two sub-districts into 20 equally divided geographical clusters out of which 10 clusters were randomly selected. Further, in each cluster, systematic random sampling method was used to select the households using a sampling interval of 3. The first household was considered as the starting point of sampling and then, every third household was selected. If the selected household did not have any elderly individual, then the next household was approached. This process was continued until 50 respondents were interviewed from each cluster. Finally, 471 respondents were included in the study. Sixteen of these respondents were refused for interview, 4 respondents were belonging to other religion and 9 questionnaires were rejected due to incompleteness.

Two sets of questionnaire were used to gather the data. The first set contained the basic socio-economic, demographic and health-related information such as age, education level, gender, status of living (with family/live alone), smoking habits, alcohol consumption, physical exercise and suffering from any chronic diseases such as cancer, hypertension, diabetes, cardiovascular diseases, back pain, arthritis, visual and hearing impairment. The data related to chronic diseases were self-reported data from the respondents. This set of questions was developed after reviewing literatures extensively. The second set of questionnaire was Short Form Health Survey which included 36 items in the SF-36v2 survey questionnaire is a very well-known generic and comprehensive health survey scale with reliability of more than 0.7 and is widely used to measure HRQOL globally [11, 12]. This SF-36v2 questionnaire measures HRQOL in eight subscales Physical Functioning (PF), Role Physical (RP), Bodily Pain (BP), Vitality (VT), General Health (GH),

Table 1 Respondent characteristics by gender and age groups (n = 471)

Variables	All no (%)	Gender group		P	Age group		P*
		Men N (%)	Women N (%)		60-75 N (%)	>75 N (%)	
Age (years)							
60-75	375 (79.6)	155 (78.7)	220 (80.3)	0.376			
> 75	96 (20.4)	42 (21.3)	54 (19.7)				
Religion							
Buddhist	390 (82.8)	163 (82.7)	227 (82.8)	0.536	318 (84.8)	72 (75.0)	0.200
Islam	81 (17.2)	34 (17.3)	47 (17.2)		57 (15.2)	24 (25.0)	
Education							
Illiterate	152 (32.3)	76 (38.6)	76 (27.7)	0.009	99 (26.4)	53 (55.2)	<0.001
Literate	319 (67.7)	121 (61.4)	121 (61.4)		276 (73.6)	43 (44.8)	
Living status							
With family	442 (93.8)	184 (93.4)	258 (94.2)	0.439	352 (93.9)	90 (93.8)	0.561
Alone	29 (6.2)	13 (6.6)	16 (5.8)		23 (6.1)	6 (6.3)	
Smoking status							
No	354 (75.2)	88 (44.7)	266 (97.1)	<0.001	284 (75.7)	70 (72.9)	0.327
Yes	117 (24.8)	109 (55.3)	8 (2.9)		91 (24.3)	26 (27.1)	
Alcohol drinking							
No	325 (69.0)	80 (40.6)	245 (89.4)	<0.001	254 (67.7)	71 (74.0)	0.146
Yes	146 (31.0)	117 (59.4)	29 (10.6)		121 (32.3)	25 (26.0)	
Exercise							
No	302 (64.1)	125 (63.5)	177 (64.6)	0.436	226 (60.3)	76 (79.2)	<0.001
Yes	169 (35.9)	72 (36.5)	97 (35.4)		149 (39.7)	20 (20.8)	
Chronic disease							
No	80 (17)	26 (13.2)	54 (19.7)	0.041	79 (21.1)	1 (1.0)	<0.001
Yes	391 (83)	171 (86.8)	220 (80.3)		296 (78.9)	95 (99.0)	

*Chi-square test

Social Functioning (SF), Role Limitation due to Emotional Problems (RE) and Mental Health (MH). The Cronbach α coefficient of each subscales was found in a previous study as follows: PF, 0.92, RP, 0.98, BP, 0.72, VT, 0.79, GH, 0.70, SF, 0.72, RE, 0.98 and MH, 0.79 [13]. In this study, the Thai version of SF-36v2 questionnaire was used, as the collected data was assumed to be more meaningful if adapted to the local language and context.

Three subscales: PF, RP, BP are associated with GH and contribute to the Physical Component Summary (PCS) measures scores. Also other three subscales: MH, RE and SF associate with VT and give the Mental Component Summary (MCS) measure scores [14]. Each of these PCS and MCS scores were calculated using eight subscales and the scores range from 0 to 100. Zero (0) is considered as a worse score whereas 100 is levelled as the highest or best score [15]. Further, the total scores of PCS and MCS were categorised into two groups such as low and high using the mean standard score of 50 and were calculated based on the standard SF-36 procedures in the test manual [11, 16, 17]. The responses to the questionnaire were collected by trained interviewers through face to face interviews. The interviews lasted about 20-30

minutes for each participant.

The PCS and MCS component summaries of HRQOL were taken as an outcome variables in this study. The other data collected such as age, gender, religion, education, living status, smoking habits, alcohol drinking, physical exercise and presence of chronic disease were considered as independent variables.

Statistical analysis

Data were analysed using a statistical software program version 18. Descriptive statistics such as percentages, frequencies, means and standard deviations were used for analysing the information on the demographic characteristic of the subjects. Chi-square test was used to measure the relationship between potential predictor variables with gender and age groups. Independent t-tests were also performed to compare the differences in the PCS and MCS scores between gender and age groups. Finally, logistic regression was computed to assess the effect of the predictor variables on the PCS and MCS components of HRQOL. Odds Ratio (OR) and 95% of Confidence Interval (CI) were used as an indicator of strength of association. The significance level was set at $p \leq 0.05$.

Table 2 Disease characteristics of the study participants (n=471)

Characteristics	n	%
Back pain	308	65.4
Hypertension	186	39.5
Hearing and visual impairment	185	39.3
Diabetes	90	19.1
Arthritis	75	15.9
Cardio vascular disease	40	8.5
Cancer	23	4.9
Existence of any disease*		
yes	391	83.0
No	80	17.0

*Multiple disease in some patients

Table 3 Comparison of PCS and MCS scores by gender and age group

HRQOL	ALL	Gender group		P*	Age group		P*
		Men n = 197	Women n = 274		60-75 n = 375	>75 n = 96	
PCS	43.29 ± 8.85	43.06 ± 9.06	43.46 ± 8.71	0.631	49.04 ± 9.18	41.82 ± 8.15	<0.001
MCS	66.39 ± 15.05	68.95 ± 14.74	64.55 ± 15.03	0.002	68.75 ± 13.88	57.18 ± 15.95	<0.001

* Independent t-test

PCS – Physical Component Summary, MCS – Mental Component Summary

Ethical consideration

The research protocol was approved by the research and ethics committee of St. Theresa International College (No. STIC 021/2014). Prior informed consent was taken from each participant before the interview and confidentiality was strictly maintained.

RESULTS

The average mean age of study sample was 67.60 (SD=8.2), ranging from 60 to 98 years. Out of the total respondents who participated in this study, men composed of 197 (41.8%) of the sample with a mean age of 67.14 (SD=7.8) and women comprised of 274 (58.2%) of the sample with a mean age of 67.93 (SD=8.5). Further, 375 (79.6%) participants were between 60 to 75 years with a mean age of 64.1 (SD=4.1) and 96 (20.4%) respondents were more than 75 years with a mean age of 81.28 (SD=5.6).

Table 1 shows that the demographic information about the study participants with a comparison between gender and age groups. Among all participants, 390 (82.8%) individuals were Buddhist and 81 (17.2%) were Islamic. Further, about 32.3 percent of respondents were illiterate and 6.2 percent stay alone. Alcohol is consumed by 31 percent participants while 24.8 percent have a smoking habit. Furthermore, only 35.9 percent of participants have an exercise habit and around 83 percent of the sample suffers from at least one chronic health condition.

Table 1 also indicates that education, smoking status, alcohol drinking and presence of chronic disease are significantly different between men and women. Similarly, education, exercise and presence of chronic disease were found to be significantly different among respondents with 60-75 age groups than those having more than 75 years of age.

Table 2 illustrates that of the total number, 308 (65.4%) individuals were suffering from back pain, 186 (39.5%) individuals from hypertension, 185 (39.3%) participants from hearing and visual impairment, 90 (19.1%) individuals suffer from diabetes, 75 (15.9%) from arthritis, 40 (8.5%) from cardio vascular disease and 23 (4.9%) had cancer. These diseases were mostly found widespread among study sample.

Table 3 demonstrates the comparison of PCS and MCS scores by gender and age groups. The mean PCS score for all participants was 43.29 (SD=8.85) and the mean MCS score was 66.39 (SD=15.05). The gender comparison suggested that the mean MCS scores were significantly different ($p=0.002$) between men and women. However, the age comparison showed that individuals with more advanced age had significantly lower scores for both PCS and MCS measures of HRQOL ($p<0.001$).

Table 4 illustrates the results of a multivariate logistic regression analysis to examine the effects of the independent predictors on the PCS and MCS components of HRQOL. It also assessed the risk of having a score lower than the standard mean score of 50 or more. The findings suggested that

Table 4 Result of logistic regression analysis for PCS and MCS

Variables	PCS		MCS	
	OR*(95% CI)	P	OR*(95% CI)	P
Age (years)				
60-75	1 (Ref)		1 (Ref)	
>75	1.20 (1.11-3.35)	0.006	2.69 (1.38-5.26)	0.004
Gender				
Male	1 (Ref)	0.394	1 (Ref)	0.144
Female	0.73 (0.36-1.48)		1.87 (0.80-4.37)	
Religion				
Buddhist	1 (Ref)	0.631	1 (Ref)	0.212
Muslim	1.20 (0.56-2.56)		0.55 (0.22-1.39)	
Education				
Illiterate	1 (Ref)	0.107	1 (Ref)	0.007
Literate	1.63 (0.89-2.98)		0.38 (0.19-0.77)	
Living status				
With family	1 (Ref)	0.542	1 (Ref)	0.002
Alone	1.44 (0.44-4.72)		4.50 (1.75-11.58)	
Smoking status				
No	1 (Ref)	0.966	1 (Ref)	0.583
Yes	1.01 (0.44-2.35)		1.32 (0.48-3.62)	
Alcohol drinking				
No	1 (Ref)	0.390	1 (Ref)	0.827
Yes	1.39 (0.65-3.00)		1.10 (0.45-2.70)	
Exercise				
No	1 (Ref)	0.367	1 (Ref)	0.100
Yes	1.31 (0.72-2.40)		0.52 (0.24-1.13)	
Chronic disease				
No	1 (Ref)	0.048	1 (Ref)	0.754
Yes	1.15 (1.12-2.93)		1.18 (0.41-3.34)	

*Odds Ratio (OR) shows risk of having low quality of life

regardless of other factors, more advanced age individuals (> 75 years) possess an higher risk of having worse HRQOL in both physical and mental components [OR: 1.20, 95% CI 1.11 to 3.35 and OR: 2.69, 95% CI 1.38 to 5.26 respectively]. Moreover, those who suffer from chronic disease were having a higher risk of lower quality of life as regards with physical component scores (PCS) [OR=1.152, 95% CI 1.12 to 2.93]. Furthermore, the literate individuals had a lower risk of having low mental health related quality of life than that of illiterates [OR= 0.38, 95% CI 0.19 to 0.77] whereas those participants who lived alone had a higher risk of having low mental health related quality of life than those who stayed together with their family [OR: 4.50, 95% of CI 1.75 to 11.58].

DISCUSSION

This study examined the HRQOL scores using SF-36 version 2 and the physical and mental component scores were compared between gender and age groups of the elderly residing in Bungsan and Ongkarak sub-district of Nakhon Nayok Province, Thailand. Further, the factors influencing HRQOL of the elderly were assessed in the present study.

The findings from the studied sample showed that those who live alone had worse HRQOL for MCS whereas there was no change in physical aspect of HRQOL. Further, there was no difference in quality of life by gender. This result is consistent with previous studies of Thailand [18]. However, a study conducted among elderly in Spain found that women scored worse in HRQOL than men [19]. Also, few studies found that women scored low in physical aspects of HRQOL than that of mental aspects of HRQOL [20-22]. Similarly, our study found that literate individuals were perceived to have a higher mental component of HRQOL than the illiterate persons.

The findings of the study also suggest that older people with the age above 75 years obtain significant lower scores when compared with the 60-75 year age group. This signifies that being older they have both worse quality of life on both Physical and Mental Summary components of HRQOL. Further, when the socio-demographic variables were adjusted, the study showed that age groups could significantly affect both the Physical and Mental components of HRQOL. These findings are also supported by other studies [6, 8, 23] which stated

that more advanced age people had a lower scores in almost all scales of HRQOL. This debates for an urgent attention for older people with most supportive and accessible health care solutions.

Moreover, back pain, hypertension, hearing and visual impairment, diabetes and arthritis were the most common chronic health ailments among the elderly respondents. These results were similar to the findings of past studies conducted in Samsun province of Turkey [5]. This study also suggested that suffering from chronic diseases creates potential decrease in physical components of HRQOL leading to low quality of life. However, some studies found that there were decrease in both physical and mental components of HRQOL [5]. Therefore, it can be suggested that health services for old people need to be strengthened as a priority issue. Overall, this study recognizes that the lowering of HRQOL is not merely caused by aging, but also by other variables such as education, living status and development of chronic disease. All of these contribute to the potential impact on HRQOL [24, 25].

LIMITATION OF THE STUDY

There are three limitations of this study. The first limitation is that this study uses cross-sectional study design and thus difficult to discover the direction of causation [26] because data were collected at one point in time. Second, a very few participants could not complete the SF-36v2 by themselves because of cognitive complications. Therefore, family members or close relatives were asked to provide proxy data. Third, a longitudinal study with larger sample size is also needed for further exploration about HRQOL among more advanced age populations.

CONCLUSION

The results of our study could be helpful to policy makers, experts, health managers and planner to consider old and advanced age population as high risk group and they should be given special attention. In addition, the study clearly identified some of the factors such as higher age, education, living status and chronic diseases were the strongest determinants that could decrease the HRQOL among older people. Therefore, it is highly recommended that prevention efforts needs to be tailor made to target those elderly with higher age (> 75 years), living alone and suffering from chronic diseases to improve their health status. The health care system of Thailand should call attention to HRQOL in old population, so that their overall health status and good quality of life can be achieved.

CONFLICT OF INTEREST

The authors have no conflict of interest.

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REFERENCES

1. World Health Organization [WHO]. World health statistics. Geneva: WHO; 2010. [Cited 22 January 2015]. Available from: http://www.who.int/whosis/whostat/EN_WHS10_Full.pdf
2. National Statistical Office [NSO]. 2010 population and housing census (whole kingdom). 2010. [Cited 22 January 2015]. Available from: <http://popcensus.nso.go.th/file/popcensus-10-01-56-E.pdf>
3. Leelapan P. Situation of the aged society in Thailand. Bangkok: Health System Research Institute; 2002. (in Thai).
4. Ministry of Social Development and Human Security. Annual report on elderly people situation in Thailand. Bangkok: Minsitry; 2009. (in Thai).
5. Canbaz S, Sunter AT, Dabak S, Peksen Y. The prevalence of chronic diseases and quality of life in elderly people in Samsun. Turk J Med Sci. 2003; 33(5): 335-40.
6. Osborne RH, Hawthorne G, Lew EA, Gray LC. Quality of life assessment in the community-dwelling elderly: validation of the Assessment of Quality of Life (AQoL) Instrument and comparison with the SF-36. J Clin Epidemiol. 2003; 56(2): 138-47.
7. Wilson IB, Cleary PD. Linking clinical variables with health-related quality of life: a conceptual model of patient outcomes. JAMA. 1995; 273(1): 59-65.
8. Guallar-Castillón P, Sendino AR, Banegas JR, López-García E, Rodríguez-Artalejo F. Differences in quality of life between women and men in the older population of Spain. Soc Sci Med. 2005; 60(6): 1229-40.
9. Bungsan Sub-district Administrative Organisation [SAO]. 2010 Population census statistics. Bungsan, Thailand; 2015.
10. Ongkarak Sub-district Administrative Organisation [SAO]. 2010 Population census statistics. Ongkarak, Thailand; 2015.
11. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36): I. conceptual framework and item selection. Med Care. 1992; 30(6): 473-83.
12. McHorney CA, Ware JE Jr, Raczek AE. The MOS 36-item short-form health survey (SF-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. Med Care. 1993; 31(3): 247-63.
13. Rachpukdee S, Howteerakul N, Suwannapong N, Tang-Aroonsin S. Quality of life of stroke survivors: a 3-month follow-up study. J Stroke Cerebrovasc Dis. 2013; 22(7): e70-8.
14. Ware JE, Jr, Gandek B. Overview of the SF-36 Health Survey and the International Quality of Life Assessment

- (IQOLA) Project. *J Clin Epidemiology*. 1998; 51(11): 903-12.
15. Ware JE, Snow KK, Kosinski M, Gandek B. SF-36® Health survey manual and interpretation Guide. Boston, MA: New England Medical Center, The Health Institute; 1993.
 16. Hays RD, Sherbourne CD, Mazel R. User's manual for the medical outcomes study (MOS) Core Measures of Health-related Quality of Life. [S.l.]: Rand Corporation; 1995.
 17. Zhang L, Xu DZ, Huang JY, Li LS. Study on the application of the Chinese version of SF-36 scales and selection of interceptive cents for its grade range. *Zhonghua Liu Xing Bing Xue Za Zhi*. 2004; 25(1): 69-73.
 18. Apidechkul T. Comparison of quality of life and mental health among elderly people in rural and suburban areas, Thailand. *Southeast Asian J Trop Med Public Health*. 2011; 42(5): 1282-92.
 19. Garcia Villanueva MZ, Uterga Valiente JM, Rodriguez-Antiguedad Zarranz A. Quality of Life in an Adult Population of More than 60 Years of Age without Cognitive Impairment. *Dement Geriatr Cogn Dis Extra*. 2014; 4(3): 355-63.
 20. Borglin G, Jakobsson U, Edberg AK, Hallberg IR. Self-reported health complaints and their prediction of overall and health-related quality of life among elderly people. *Int J Nurs Stud*. 2005; 42(2): 147-58.
 21. López-García E, Banegas JR, Graciani Pérez-Regadera A, Gutiérrez-Fisac, JL, Alonso J, Rodríguez-Artalejo F. Population-based reference values for the Spanish version of the SF-36 health survey in the elderly. *Med Clin (Barc)*. 2003; 120(15): 568-73.
 22. Orfila F, Ferrer M, Lamarca R, Tebe C, Domingo-Salvany A, Alonso J. Gender differences in health-related quality of life among the elderly: the role of objective functional capacity and chronic conditions. *Soc Sci Med*. 2006; 63(9): 2367-80.
 23. Montazeri A, Goshtasebi A, Vahdaninia M, Gandek B. The Short Form Health Survey (SF-36): translation and validation study of the Iranian version. *Qual Life Res*. 2005; 14(3): 875-82.
 24. Franzen K, Saveman BI, Blomqvist K. Predictors for health related quality of life in persons 65 years or older with chronic heart failure. *Eur J Cardiovasc Nurs*. 2007; 6(2): 112-20.
 25. Tajvar M, Arab M, Montazeri A. Determinants of health-related quality of life in elderly in Tehran, Iran. *BMC Public Health*. 2008; 8: 323. DOI: 10.1186/1471-2458-8-323
 26. Burns N, Grove SK. The practice of nursing research. 6th ed. St. Louis, MO: Saunders Elsevier; 2009.